

**(12) PATENT**  
**(19) AUSTRALIAN PATENT OFFICE**

**(11) Application No. AU 199943453 B1**  
**(10) Patent No. 714299**

(54) Title  
Prize awarding system

(51)<sup>6</sup> International Patent Classification(s)  
A63F 009/22

(21) Application No: 199943453 (22) Application Date: 1999 .08 .09

(43) Publication Date : 1999 .12 .23  
(43) Publication Journal Date : 1999 .12 .23  
(44) Accepted Journal Date : 1999 .12 .23

(71) Applicant(s)  
Neurizon Pty Ltd

(72) Inventor(s)  
Steven Brian Johnson

(74) Agent/Attorney  
CULLEN and CO, GPO Box 1074, BRISBANE QLD 4001

(56) Related Art  
WO 99/03078  
WO 97/12338  
WO 96/24421

## ABSTRACT

Periodic prize draws are conducted by a jackpot controller (13) in a gaming system having one or more electronic gaming devices (10). The probability of each 5 electronic gaming device winning a particular prize draw is dependent upon the amount wagered on that gaming machine during a period preceding that prize draw. The prize may be a progressive jackpot which comprises an initial starting value and a contribution from the 10 amounts wagered on the electronic gaming devices. If an electronic gaming device wins a prize draw, its player may be granted a feature game to determine the actual prize. Jackpots are suspended pending the completion of the feature game. The probability that a gaming device 15 will win the prize draw, or the relative win probabilities of the gaming devices, may be displayed graphically.

**AUSTRALIA**

*Patents Act 1990*

COMPLETE SPECIFICATION  
FOR A STANDARD PATENT

Name of Applicant: NEURIZON PTY LTD

Actual Inventor: STEVEN BRIAN JOHNSON

Address for Service: CULLEN & CO.,  
Patent & Trade Mark Attorneys,  
240 Queen Street,  
Brisbane, Qld. 4000,  
Australia.

Invention Title: PRIZE AWARDING SYSTEM

The following statement is a full description of this invention, including the best method of performing it known to us

## PRIZE AWARDING SYSTEM

This invention relates to a prize awarding system. In particular, the invention is directed to method and apparatus for awarding a prize to players of 5 gaming machines, wherein the probability that the player of a gaming machine will win the prize is dependent upon the amount bet on that gaming machine during an elapsed period.

## BACKGROUND ART

10 An electronic gaming device (EGD), such as a poker machine, provides its player with the opportunity to win cash or other prizes. To entice more persons to play EGDs and/or to render them more exciting, it is known to link EGDs electronically in a network, with each 15 EGD contributing a proportion of its turnover to a pooled jackpot. The EGDs in a network may be located on one site, or spread over several remote sites. Since a larger number of EGDs contribute to the jackpot, the 20 jackpot can have a higher value and/or be won more often than single machine jackpots.

In a typical progressive linked jackpot system, one or more EGDs contribute a percentage of turnover to a pool (either on a local or external network). Each time 25 an EGD is played, it tests for a particular winning combination. If that combination is achieved, the EGD is awarded the pool. A key aspect of this arrangement is that each game played has the same probability of a jackpot win.

This arrangement has traditionally been used by 30 casinos but its popularity is diminishing due to the introduction of EGDs featuring multiple line and multiple credits per line wagering options. If a player elects to play multiple credits per line, the win probability would no longer be proportional to the wager. That is, the win 35 probability would be the same regardless of the number of credits wagered on the line. This is considered a major disincentive to wagering multiple credits per line. This arrangement also requires the EGD to provide special

software which tests for the winning combination. Further, it is difficult to link EGDs of differing base denominations to the same progressive jackpot pool.

Another type of jackpot system is described in 5 Australian patent no. 655801. In this type of jackpot system, one or more EGDs are typically connected to an external Random Jackpot Controller (RJC) via a data network. As each game is played, the RJC adds a proportion of each wager to the external pool. The RJC 10 initially seeds the pool with a starting value. The RJC then selects a random number between the starting value and a predetermined maximum value. As each EGD is played, each EGD informs the RJC of the credits bet and a proportion of the wager is added to the pool. The value 15 of the pool is then compared with the selected random number. If there is a match, the RJC awards the current pool value to that EGD. This arrangement is usually configured to provide relatively small but frequent awards, and has the inherent characteristic that the 20 probability of a win on each EGD increases as the pool increases toward the maximum limit.

However, since the win probability increases as the pool increases towards its predetermined maximum limit, a player playing just after the pool is reset has 25 a lower jackpot win probability than a player playing at a later time when the pool is greater, even though both players may be wagering the same amount. For this reason, this arrangement is generally considered unfair and deterministic. The deterministic nature of this 30 jackpot system has led some gaming authorities to prohibit the inclusion of the pool contributions into the "Return to Player Percentage" (RTP) for taxation calculation purposes, which diminishes the financial appeal of this jackpot system to gaming machine 35 operators.

Yet another type of jackpot system is described in international patent application no. PCT/AU98/00525. In that jackpot arrangement, one or more EGDs are

typically connected to an External Feature Game Controller (EFGC) via a communications network. Each EGD informs the EFGC of credits bet and a proportion of the credits bet is added to the external jackpot pool. This 5 pool is typically seeded with a starting value.

As each game is played (and only when a game is played), the EGD tests for the occurrence of a random "win" event whose probability is a function of the credits bet on that particular game. If the EGD detects 10 the random event, the EFGC is informed. The EGD then typically enters a feature game where the winning amount is determined. The EFGC is informed of the win and in some cases will transmit the value of the win to the EGD's credit meter. In other cases, the EGD will be 15 locked up until the jackpot is paid manually by an attendant. The greater the wager per game the greater is the probability of a win on that game.

A disadvantage of this arrangement is that it is not easily applied to an existing EGD installation. 20 Each EGD must be fitted with special software with a means of determining and detecting the random event per game. Alternatively, a communications-based Central Feature Game Controller (CFG C) may theoretically be employed which has a means of determining and testing for 25 the random event per game on behalf of each EGD, based on the credits bet on each game.

Many jurisdictions have mandated the use of specialised communications networks designed to collect 30 EGD data and to provide a means of external control over the EGDs. Some operators of these networks have implemented their own jackpot awarding systems utilising these networks. These networks however, cannot guarantee that each EGD's data will be collected in synchronisation with each EGD's game cycle. Further, many of these 35 communications networks do not even support the collection of "credits bet" data from EGDs. In some cases there may be over 6 games played between data

collections. If a CFGC utilised these networks for the collection of the credits bet information for the purpose of centrally determining the random event based on credits bet on each game, there would be a real 5 likelihood that many played games would be missed due to the data collection latency of the communications systems. This would result in those games still contributing to the jackpot pool but with no chance of winning the prize. This makes it impractical to use 10 credits bet per game as a basis for the determination of the random event on a game-by-game basis in a CFGC acting on behalf of each EGD.

A further problem with this jackpot arrangement is that once an EGD enters its feature game for the 15 purpose of determining the actual prize, one of the available pools is always going to be awarded regardless of the feature game outcome. There is no technical barrier to a smart player deferring the playing of the feature game to allow the jackpot pool to increase in 20 value. The longer the player waits, the greater the potential pool increase and the greater the prize. In an extreme example, the player could wait until the feature game is triggered on another contributing EGD, then immediately play the feature game and effectively steal 25 the other player's prize.

It is an object of this invention to provide an improved prize awarding system for a network of EGDs, which overcomes or ameliorates the above described disadvantages or which at least provides a useful 30 alternative.

#### SUMMARY OF THE INVENTION

In one broad form, the invention provides a method of awarding a prize in a gaming system comprising at least one gaming machine, characterised in that the 35 probability of each gaming machine winning the prize is dependent upon at least some of the amount wagered on that gaming machine during an elapsed period.

In the preferred embodiment, prize draws are

held periodically. Prior to each prize draw, the probability of each gaming machine winning that draw is calculated.

5 In another form, the invention provides a gaming system comprising

at least one gaming machine;

control means connected to the gaming machine(s), the control means being adapted to conduct a series of prize draws in each of which each gaming 10 machine has an opportunity to win a prize on a non-deterministic basis; and

means for determining the winning probability of each gaming machine at each prize draw,

15 characterised in that the probability of each gaming machine winning a prize draw is dependent on at least some of the amount wagered on that gaming machine during an elapsed period.

In yet another form, the invention provides a gaming machine having

20 means for effecting a prize draw to award a prize on a non-deterministic basis, and

means for determining the probability of the gaming machine winning the prize, .

25 characterised in that the probability of the gaming machine winning the prize is dependent on at least some of the amount wagered on the gaming machine during an elapsed period.

Preferably, the probability is related to the total wagered amount recorded during the elapsed period.

30 The elapsed period is typically a rolling or sliding period of time, preceding each prize draw.

Draws may be held at periodic intervals which are shorter than the sliding period of time. In that

case, the amount wagered during the period between draws is calculated on a *pro rata* basis from the recorded amount of wagers during the predetermined elapsed period.

5 The prize may suitably be a cash prize, such as a progressive jackpot.

In a further embodiment of the invention, if a gaming machine wins a prize draw, it is awarded a feature game to determine the actual prize or jackpot. All 10 jackpot pools are suspended until the feature game is played.

Advantageously, the probability of a gaming device winning the prize draw, and/or the relative probabilities of the gaming machines winning the prize draw, are displayed graphically.

15 The prize awarding system of this invention enables a jackpot or other prize to be awarded on a non-deterministic basis, yet in a fair manner, as the probability that a gaming machine will win the prize depends on the amount of recent betting activity on that 20 gaming machine.

In order that the invention may be more fully understood and put into effect, preferred embodiments thereof will now be described with reference to the accompanying drawings.

#### 25 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram of a jackpot system for a network of gaming devices.

Fig. 2 is a flow chart for the method of 30 jackpot pool calculation.

Fig. 3 is a flow chart for the method of determining a jackpot win according to one embodiment.

Fig. 4 is a flow chart for the method of calculating jackpot pool and determining jackpot win according to a second embodiment.

#### 35 DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

In one embodiment, illustrated schematically in Fig. 1, a plurality of Electronic Gaming Devices (EGDs) 10 operating in a modern gaming environment are connected

to a communications network 11, typically running over RS485, Fibre Optic, Ethernet, or other suitable data transmission cable. The communications network 11 has an EGD monitoring device 12, such as a site controller or 5 polling front-end processor. The EGD monitoring device will be referred to as the monitoring system. The monitoring system 12 collects financial and other information from the EGDs. This information is commonly referred to as "meters".

10 The monitoring system 12 contains a Special Prize Presentation Controller Task which in this embodiment, is a jackpot controller 13 capable of maintaining one or more jackpot pools. The jackpot controller 13 displays the current value of each jackpot 15 pool on one or more jackpot displays 14. These displays may be remote from the EGDs, either connected to the communications network 11 or to the jackpot controller 13 directly.

19 The gaming system may optionally include an 20 alternative or additional jackpot controller 13A with its associated display 6. The EGDs may also have local 25 jackpot displays 15 which may be operated by the jackpot controller(s), via the communication network.

29 The jackpot controller 13 calculates and 30 manages the jackpot pools from the information provided to it by the monitoring system 12. The only meter required by the jackpot controller from the monitoring system is the current value of the turnover meter of each EGD. The turnover meter is represented in local base 35 currency units (e.g. cents). The turnover meter usually indicates the accumulated turnover, e.g. credits bet, since the EGD was commissioned. The jackpot controller calculates from the received turnover meter reading, the change in turnover since the last time the turnover meter was read. This is the primary figure used for all jackpot calculations.

39 For each jackpot, the jackpot controller maintains a prize pool. This prize pool is a calculated

pool, comprising (i) a starting value of the jackpot, and (ii) a proportion, equal to the contribution percentage, of the increased turnover of each EGD contributing to the pool since the last jackpot was won. For example a 5 jackpot pool with a 3% contribution will increase by 3 cents for every dollar wagered on an EGD connected to the jackpot. This pool is normally the prize granted to the winning player when a jackpot is won.

In the jackpot system of this embodiment, the 10 probability of an EGD winning the jackpot is dependent upon the turnover of that EGD over a predetermined elapsed period of time. This period of time is a sliding or rolling "window" of time prior to each jackpot draw.

Every change in turnover meter recorded for an 15 EGD is stored by the jackpot controller with a timestamp. The timestamp indicates the time that the change in turnover meter was recorded. Each recorded change in turnover meter may contain the turnover from multiple game plays. It is possible that there may be no change 20 in turnover meter since the last record, in which case a change in turnover meter of zero cents is recorded. Only turnover recorded within the sliding time window or "Record Period" is used for the purposes calculating the probability of a jackpot win.

25 For example, Table 1 shows the turnover information recorded for three EGDs for a Record Period equal to the immediately preceding 30-second period. The turnover meters of the EGDs are nominally read approximately once every 10 seconds. The current time for 30 the purpose of the example is 10:29:20. Hence the relevant window of time or Record Period was that period between 10:28:50 and 10:29:20.

As shown in Table 1, EGD 1 had its change in turnover meter recorded approximately every 8 Seconds, 35 EGD 2 approximately every 7 Seconds and EGD 3 approximately every 11 Seconds. This variation is due to operational variances across machines such as type, model, vintage, manufacturer and network characteristics.

Table 2 shows the changes in turnover meter recorded for the same three EGDs at 10:29:30, i.e. after a further 10 seconds have elapsed. The relevant window of time or Record Period is now that period between 5 10:29:00 and 10:29:30.

During the further 10 second period, several recorded values aged to a point where they were greater than 30 seconds old, and were therefore discarded. For each EGD one new change in turnover was recorded. The 10 discarded turnover values are shown in Table 3.

It can be seen from the tables that the rolling Record Period allows for variations in operational characteristics by collating all turnover changes during a sliding period. This allows all machines to have a 15 fairer record of activity than individual change in turnover meter figures. Individual turnover figures per EGD may be recorded at varying frequencies. By running a sliding window any variation in operational characteristics can be normalized.

20 In this embodiment, the method of determining the winner of a jackpot employs a second time window, known as the Draw Period. The Draw Period is the duration between attempts at awarding the jackpot, or in other words, the duration between opportunities for an 25 EGD to win the jackpot, known as jackpot "draws". To ensure that no turnover change is excluded from the draw processing, the Draw Period can equal, but not exceed the Record Period.

20 The probability that an EGD will win a jackpot draw depends on a calculated scaling factor. In this embodiment, the scaling factor is based on estimated turnover during the Draw Period which is calculated by taking, for each EGD, the total turnover in the Record Period, and dividing it by the number of Draw Periods per 35 Record Period. (Because a division is involved, any fractional cent of the result is counted as one whole scaling unit). That is, based on actual turnover during the whole Record Period, an estimated or average turnover

is calculated for the Draw Period on a *pro rata* basis. If the turnover is in cents, then the Scaling Factor is the number of cents in the estimated turnover during the Draw Period.

5 For example, using the data from the EGDs above, if the Record Period is 30 Seconds, and the Draw Period is 10 Seconds, Table 4 shows the calculated Scaling Factor for each EGD for the two draw times given as examples above.

10 The Scaling Factor determines the probability than an EGD will win the jackpot at a draw time. Namely, each EGD has the same predetermined "base" probability of winning the jackpot, but this is multiplied by the Scaling Factor for that EGD for the relevant draw. Since 15 an EGD can have a varying scaling factor, it also has a varying probability of winning a jackpot draw. This probability is given by the formula:  
EGD Win Probability =

$$1 - ((1 - \text{Fixed Base Probability})^{\text{Scaling Factor}}).$$

20 Thus, if the base probability is, say, a 0.0003% chance, the probability of each EGD in Table 4 winning the Jackpot at each of the two draw times is shown in Table 5.

25 The jackpot draw for each EGD can be conducted by any suitable draw method which has the required overall probability. For example, a random number generator can be used for the draw. A fixed number range is defined, and divided into two separate sections, the winning band and the losing band. A random number is 30 generated over the entire range; if it falls within the winning band the draw is won. If it falls outside the winning band into the losing band, the draw is lost. The winning band is a percentage of the entire number range, which is equal to the desired win probability.

35 Thus, if the win probability is 0.1400%, and the number range is, say, 0 to 4294967295, the winning band is all the numbers from 0 to 6012954. The losing band is then 6012955 to 4294967295. When calculating the

win band size, because division is involved, all results are rounded up to the next whole digit in the range. If the random number generated falls within the winning band and the attempt at awarding the prize succeeds.

5 Otherwise the attempt fails. Table 6 gives the varying win band sizes for the probabilities given in Table 5.

If an EGD wins a draw, the EGD is placed into a winning mode and the prize won is advertised on the displays 14, 15. The act of awarding a prize need not necessarily terminate the draw processing and it is possible for another EGD to be selected as a winner in its draw. If there are multiple winners, the prize pool is preferably paid to the first detected winner and all other winners are awarded the reset or starting value of the pool. Alternatively, the prize pool is apportioned between all the winners.

Table 7 shows the assumptions and configuration options of a typical high win rate, small prize Jackpot Pool.

20 Table 8 gives the operational characteristics of a jackpot so configured, operating as described by this embodiment.

25 For the embodiment having the parameters and operational characteristics specified in Table 8 and Table 9, a typical sequence of events for the jackpot would be as follows:

Referring to the flow chart of Fig. 2, the jackpot is started at its reset or starting value (\$50.00). Players bet credits on the EGDs, and 30 contribute to the accumulated turnover on each EGD. A percentage of the change in turnover meters of all EGDs since the start of the jackpot is added to the jackpot pool such that after 2 hours of play, the Jackpot would be expected to be worth approximately \$75.00 (\$50.00 + 35 \$25.00 from contributions). Any change in turnover meter for each EGD would be recorded as it is calculated in the sliding 30-second time window. All jackpot pool displays are updated with the new value reflecting added

contributions from EGDs in play. When the pool has been won, the prize is awarded to the winning EGD and the winning state of the EGD is cleared.

In parallel with calculating the current jackpot value, the Jackpot Controller 13 conducts jackpot draws. Referring to Fig. 3, a Draw Period window timer is initialized to produce 10-second timeouts, and is started. As each 10-second draw period elapses, the jackpot controller, starting from the first EGD, scans progressively through the EGDs calculating the Scaling Factor for each EGD from (i) change in turnover meter of the respective EGD in the Record Period, i.e. the last 30 seconds and (ii) the number of Draw Periods per Record Period, i.e. 3. Each EGD has a jackpot draw. It is to be noted that the timing of the draws is independent of games played on the EGD. The Scaling Factor is used to determine each EGD's respective probability of winning the jackpot. If the jackpot is won by an EGD, the EGD is placed into a winning state. Each EGD is processed in this manner until all EGDs have been processed.

This process of looking for a winner occurs continuously (every Draw Period) and is independent of the accumulation of the Jackpot Pool. As time since the Jackpot start increases, due to the increasing number of attempts to win the prize, it becomes statistically more likely that the jackpot will be granted. When the jackpot is won, the prize to be paid is held at the current jackpot value, and a new jackpot prize is started. The Jackpot Controller suspends the winning EGD and the winning amount is advertised on the jackpot display. Once the winning value is verified, it is paid to the player of the winning EGD. Payment is preferably credited electronically directly to the EGD that won. After the jackpot is granted to a player, it is reset and continues from the starting value (\$50.00).

There are various alternative implementations that achieve the same or similar outcome as the preferred embodiment. For example, the draw could be conducted

with a fixed number of attempts, say 10,000 and all attempts occur every draw. The attempts are apportioned to the EGDs based on their relative turnovers over the Record Period.

5        Further, the probability of winning the jackpot may be based on only some of the amount wagered in the Record Period, such as the maximum bet on any one game in that period, or the amount wagered in the Record Period statistically conditioned to remove abnormally small or  
10      large bets.

The calculated probability of a jackpot win can be displayed on the EGD displays 15. These displays can include a graphical indicator that informs the player of the chance of winning the Jackpot, based on average  
15      turnover over the Record Period for each EGD. The EGD display may be a rumbling volcano. The higher turnover over time played on the EGD, the fierier the volcano becomes. These displays can be controlled by the jackpot controller so that the volcano erupts on the EGD that  
20      wins the prize. Further, a leader board can be shown on an external display 14, that lists the EGDs in order from highest probability of win to lowest. These displays are designed to enhance player appeal and to create atmosphere for the Linked jackpot Game.

25        In a second preferred embodiment, when an EGD wins a draw, the EGD is informed of the win and instructed to enter a second Screen Feature Game for the purpose of determining the Jackpot Prize to be awarded. At this time, all eligible Jackpot pool values on display  
30      are suspended, i.e. held at their current values and no longer visibly increment. Preferably, the display then enters a special "About to win a Jackpot Mode" to heighten excitement. Once the player has completed the second screen feature and the jackpot prize has been  
35      determined, the winning EGD informs the Jackpot Controller of the claimed prize. The Jackpot Controller then updates all jackpot pools other than the winning jackpot to their current value (using a percentage of all

turnover accumulated since the jackpot values were held).

The player is awarded the held value of the winning jackpot and the winning jackpot is reset to the starting value, plus a percentage of any turnover accumulated 5 while the jackpot values were held. Preferably, the Jackpot Display will show a Jackpot Win sequence.

The jackpot win does not terminate the draw processing and it is possible for another EGD to win. Should there be multiple winners, each EGD will be placed 10 into the second Screen Feature to determine the prize. Once the prize is determined, the EGD wins that prize. If multiple EGDs claim the same prize, the first EGD to claim will receive the full jackpot amount on display. The other EGDs that claim the same prize will win the 15 jackpot reset value.

In a variation of this embodiment, multiple EGDs claiming the same prize simultaneously may share the prize.

A typical sequence of events for this second embodiment is shown in Fig. 4. The jackpots in a group 20 are all reset to their starting values. Players bet credits on the EGDs, and contribute to the accumulated turnover on each EGD. A percentage of the change in turnover since the start of the jackpot is added to the 25 jackpot pool. The change in turnover is recorded in the sliding 30-second time window. All relevant jackpot displays are updated with the new values for each pool. If any EGD wins the pool, the pools are suspended at their current values. The winning EGD is instructed to 30 run a second screen feature game for the purposes of determining the prize to pay. The EGD runs its second screen game as instructed. Once the EGD reports the outcome of the second Screen Game, the claimed prize is paid to the winning EGD. The winning status of the EGD 35 is cleared. The claimed pool is reset to its starting value and all jackpot pools are released and allowed to update based on turnover. Any turnover contributed while the pools were held is added into the pools after they

are released.

Various modifications can be made to the foregoing without departing from the scope of the invention. For example, each EGD can maintain its own 5 sliding Record Period and Draw Period, independent of any other EGD in the Jackpot Pool. When an EGD determines that it is going to win, it informs the controller to suspend all jackpots at their current 10 values and presents the second screen feature game to the player automatically. Once the second screen feature game is complete and a prize has been determined, the EGD informs the Jackpot Controller of the determination. The Jackpot Controller then pays the claimed prize to the 15 player and resets it. It also allows the other jackpot pools to increment again, and adds any contributions from turnover that occurred while the pool was suspended.

In a system where the Jackpot Pools may not be suspended due to limitations in the communications network, the second Screen Feature Game can be equipped 20 with a timeout that forces a determination should the player not play within a reasonable time frame. This prevents one player effectively robbing some or all of the subsequent jackpot prize from another player by excessively delaying the claim on the prize pool.

25 The above described embodiments of a prize awarding system have several advantages over the prior art systems, including

- Each eligible player or gaming machine has the opportunity of winning a prize, with the probability of 30 a win being dependent upon the amount of betting activity on that machine over a recent period, and not just the last game. This provides a fairer outcome as machines with a higher average turnover during that period have a higher win probability than machines with 35 a lower average turnover during the same period even though the latter machines may have had a higher wager on the last game.
- The trigger for a draw is not a function of individual

games played on a gaming machine. Rather it is a function of time. Therefore, the prize awarding system may be applied to existing EGDs of differing base denomination, manufacturer or game type without the need for specialised software support from the EGDs. The system can also be operated over existing communication networks and with centralised jackpot systems, including those with high poll latency timings.

- 5     ▪ Since the prize awarding is non-deterministic, the prizes can be included in the "return to player percentage" of a gaming system, effectively resulting in higher profitability for the operator of the gaming devices.
- 10    ▪ Prize awarding parameters may be changed by the gaming device operator at any time without any alterations to the hardware, firmware or internal parameters of any of the associated EGDs.
- 15    ▪ If the awarding of the prize involves a feature game, a fairer outcome is obtained by ensuring that the value of all prize pools is suspended until the completion of the feature game. This prevents players from gaining a financial advantage over subsequent players by delaying the playing of the feature game.
- 20
- 25

Table 1 : Recorded Turnover for 30 Seconds

EGD	Time of Read	Change in Turnover
1	10:29:20	\$4.35
	10:29:12	\$5.15
	10:29:04	\$3.45
	10:28:58	\$1.05
	<b>TOTAL</b>	\$14.00
2	10:29:18	\$0.36
	10:29:11	\$0.59
	10:29:04	\$0.47
	10:28:58	\$0.11
	10:28:51	\$0.73
	<b>TOTAL</b>	\$2.26
3	10:29:19	\$1.10
	10:29:08	\$0.90
	10:28:57	\$1.50
	<b>TOTAL</b>	\$3.50

Table 2 : Turnover Recorded after a Further 10 Seconds

EGD	Time of Read	Change in Turnover
1	10:29:28	\$2.15
	10:29:20	\$4.35
	10:29:12	\$5.15
	10:29:04	\$3.45
	<b>TOTAL</b>	\$15.10
2	10:29:25	\$0.94
	10:29:18	\$0.36
	10:29:11	\$0.59
	10:29:04	\$0.47
	<b>TOTAL</b>	\$2.36
3	10:29:30	\$2.40
	10:29:19	\$1.10
	10:29:08	\$0.90
	<b>TOTAL</b>	\$4.40

**Table 3 : Discarded Turnover > 30 Seconds Old**

EGD	Time of Read	Change in Turnover
1	10:28:58	\$1.05
2	10:28:58	\$0.11
	10:28:51	\$0.73
3	10:28:57	\$1.50

**Table 4 : Example Scaling Factor Calculations**

Draw Time	EGD#	Total Turnover in Record Period	Draws/Record Period	Scaling Factor
10:29:20	1	\$14.00	3	467
	2	\$2.26	3	76
	3	\$3.50	3	117
10:29:30	1	\$15.10	3	504
	2	\$2.36	3	79
	3	\$4.40	3	147

**Table 5 : Variable Probability of Win per Draw per EGD**

Draw Time	EGD#	Scaling Factor	Fixed Base Probability	Variable Win Probability
10:29:20	1	467	0.0003%	0.1400%
	2	76	0.0003%	0.0228%
	3	117	0.0003%	0.0351%
10:29:30	1	504	0.0003%	0.1511%
	2	79	0.0003%	0.0237%
	3	147	0.0003%	0.0441%

Table 6 : Win Band Size for Variable Probabilities with a maximum range of 0 - 4294967295

Draw Time	EGD#	Variable Win Probability	Win Band Size
10:29:20	1	0.1400%	0 - 6012954
	2	0.0228%	0 - 979252
	3	0.0351%	0 - 1507533
10:29:30	1	0.1511%	0 - 6489694
	2	0.0237%	0 - 1017907
	3	0.0441%	0 - 1894080

Table 7 : Assumptions and Desired Configuration of a Jackpot Pool

No of EGDs	10
Average Daily Turnover per EGD	\$1500.00
Hours in a Trading Day	18
Reset Value of the Prize	\$50.00
Desired Maximum Value of the Prize	\$150.00
Average Increase to RTP% of the connected EGDs	3%
Turnover Sliding Window	30 Seconds
Draw Time	10 Seconds

Table 8 : Operating Characteristics of this Embodiment

Average Winning Value	\$100.00
Average Duration between wins	4 Hours
Win Probability	0.0003%
Pool Increment Rate	1.5%
Minimum of the Winning band for 0.0003% prob.	0
Maximum of the Winning band for 0.0003% prob.	12884
Minimum of the Failing band for 0.0003% prob.	12885
Maximum of the Failing band for 0.0003% prob.	4294967295

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A method of awarding a prize in a gaming system comprising at least one gaming machine, characterised in that the probability of each gaming machine winning the 5 prize is dependent upon at least some of the amount wagered on that gaming machine during an elapsed period.
2. A method as claimed in claim 1 wherein the probability is related to the total wagered amount recorded during the elapsed period.
- 10 3. A method as claimed in claim 1 wherein the probability is related to the maximum amount wagered on a game during the elapsed period.
4. A method as claimed in any preceding claim, wherein the elapsed period is a rolling or sliding period 15 of time.
5. A method as claimed in any preceding claim, including the step of conducting a series of prize draws and, prior to each prize draw, calculating the probability of each gaming machine winning that draw.
- 20 6. A method as claimed in claim 5, wherein the elapsed period is a predetermined period preceding each draw, further comprising the steps of recording amounts wagered on each gaming machine and calculating the probability of each gaming machine winning that draw from 25 amount(s) recorded during the predetermined period.
7. A method as claimed in claim 6, wherein the draws are conducted at periodic intervals of time, the period between draws being no greater than the predetermined period.

8. A method as claimed in claim 6 or 7, wherein the winning probability for each gaming machine is calculated from the estimated amount wagered on that gaming machine during the period since the last draw, the 5 estimated amount being calculated on a *pro rata* basis from the recorded amount of wagers during the predetermined period.

9. A method as claimed in any one of claims 5 to 8, further comprising the step of awarding to a draw 10 winning gaming machine a further game to determine the actual prize won.

10. A method as claimed in claim 9, wherein the time allowed for playing the further game is limited to a predetermined period.

15 11. A method as claimed in claim 9 or 10, wherein the prize is a jackpot or one of a plurality of jackpots, the method further comprising the step of suspending the jackpot(s) until the determination of the further game.

12. A method as claimed in any preceding claim, 20 wherein the prize is a jackpot pool.

13. A method as claimed in claim 12, wherein the jackpot pool comprises an initial amount and a proportion of the amount wagered on the gaming machine(s) since the jackpot pool was reset.

25 14. A method as claimed in any preceding claim further comprising the step of displaying a graphical representation of the probability of the gaming machine(s) winning the prize.

15. A method as claimed in claim 14 wherein the gaming system includes a plurality of gaming machines, and the probabilities are displayed in relative format.

16. A method as claimed in any preceding claim,  
5 wherein each gaming machine is an electronic gaming device.

17. A gaming system comprising  
at least one gaming machine;  
control means connected to the gaming  
10 machine(s), the control means being adapted to conduct a series of prize draws in each of which each gaming machine has an opportunity to win a prize on a non-deterministic basis; and

means for determining the winning probability  
15 of each gaming machine at each prize draw,  
characterised in that the probability of each gaming machine winning a prize draw is dependent on at least some of the amount wagered on that gaming machine during an elapsed period.

20 18. A gaming system as claimed in claim 17 wherein the probability is related to the total wagered amount recorded during the elapsed period.

19. A gaming system as claimed in claim 18 or 19,  
wherein the elapsed period is a rolling or sliding  
25 predetermined period of time prior to each prize draw.

20. A gaming system as claimed in claim 19, wherein the control means includes means for recording during the predetermined period amounts wagered on each gaming machine.

21. A gaming system as claimed in any one of claims 18 to 20, wherein the control means includes a jackpot controller, and the prize is a progressive linked jackpot.

5 22. A gaming system as claimed in any one of claims 18 to 21, wherein each gaming machine is an electronic gaming device.

23. A gaming system as claimed in any one of claims 18 to 22, having display means to display a graphical 10 representation of the probability of each gaming machine of winning the prize draw.

24. A gaming machine having means for effecting a prize draw to award a prize on a non-deterministic basis, and 15 means for determining the probability of the gaming machine winning the prize,

characterised in that the probability of the gaming machine winning the prize is dependent on at least some of the amount wagered on the gaming machine during 20 an elapsed period.

25. A gaming machine as claimed in claim 24, wherein the probability is related to the total wagered amount recorded during the elapsed period.

26. A gaming machine as claimed in claim 24 or 25 25 wherein the elapsed period is a sliding or rolling predetermined period prior to the prize draw.

27. A gaming machine as claimed in claim 26, further comprising means for recording during the predetermined record period amounts wagered on the gaming 30 machine.

28. A gaming machine as claimed in claim 24 to 27, having display means to present a graphical representation of the probability of winning the prize draw.

5 29. A method of awarding a prize substantially as hereinbefore described with reference to the drawings.

30. A gaming system substantially as hereinbefore described with reference to the drawings.

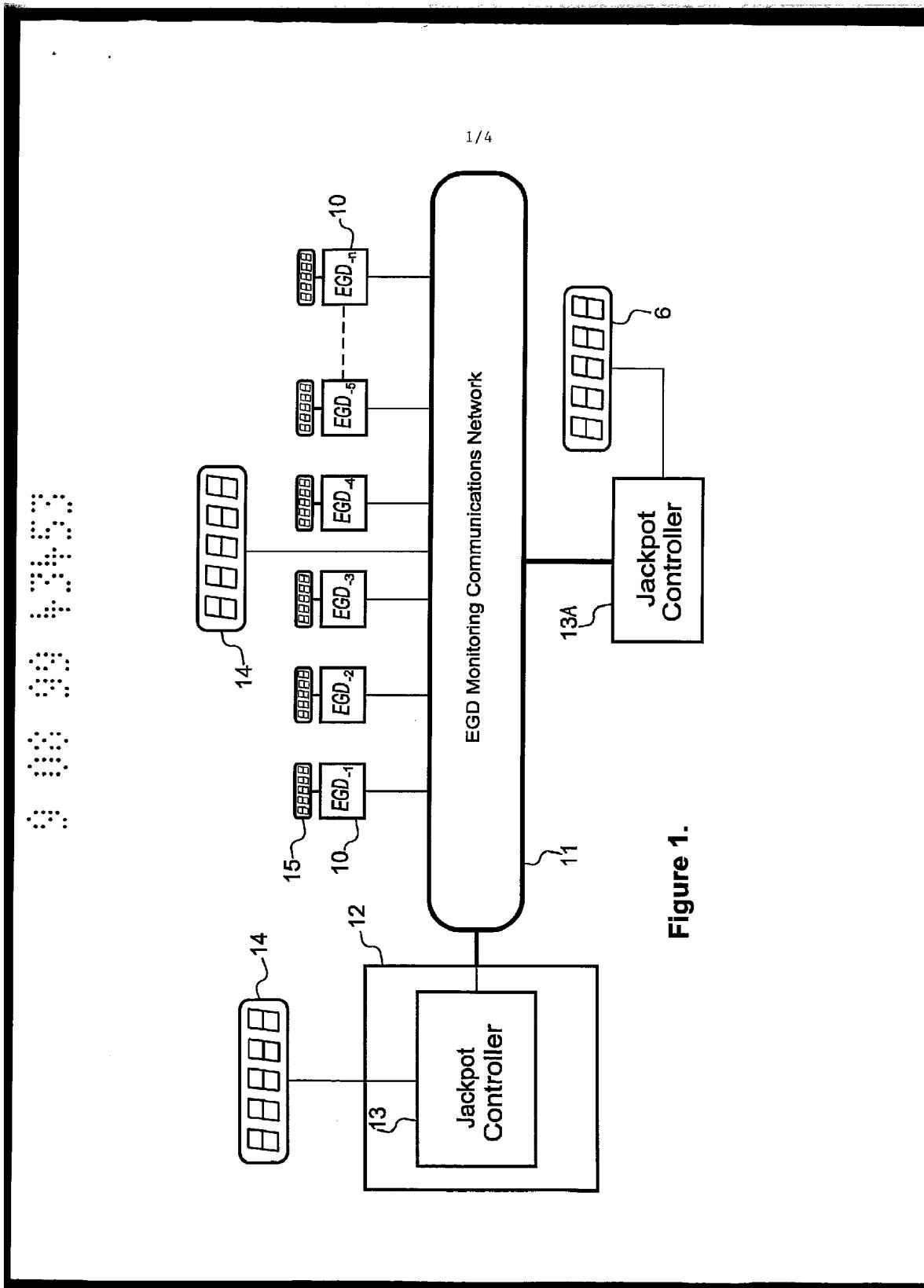
10 DATED this Ninth day of August 1999

NEURIZON PTY LTD

By their patent attorneys

Cullen & Co.

100  
101  
102  
103  
104  
105  
106  
107  
108  
109  
110  
111  
112  
113  
114  
115  
116  
117  
118  
119  
120  
121  
122  
123  
124  
125  
126  
127  
128  
129  
130  
131  
132  
133  
134  
135  
136  
137  
138  
139  
140  
141  
142  
143  
144  
145  
146  
147  
148  
149  
150  
151  
152  
153  
154  
155  
156  
157  
158  
159  
160  
161  
162  
163  
164  
165  
166  
167  
168  
169  
170  
171  
172  
173  
174  
175  
176  
177  
178  
179  
180  
181  
182  
183  
184  
185  
186  
187  
188  
189  
190  
191  
192  
193  
194  
195  
196  
197  
198  
199  
200  
201  
202  
203  
204  
205  
206  
207  
208  
209  
210  
211  
212  
213  
214  
215  
216  
217  
218  
219  
220  
221  
222  
223  
224  
225  
226  
227  
228  
229  
230  
231  
232  
233  
234  
235  
236  
237  
238  
239  
240  
241  
242  
243  
244  
245  
246  
247  
248  
249  
250  
251  
252  
253  
254  
255  
256  
257  
258  
259  
259  
260  
261  
262  
263  
264  
265  
266  
267  
268  
269  
270  
271  
272  
273  
274  
275  
276  
277  
278  
279  
280  
281  
282  
283  
284  
285  
286  
287  
288  
289  
290  
291  
292  
293  
294  
295  
296  
297  
298  
299  
300  
301  
302  
303  
304  
305  
306  
307  
308  
309  
310  
311  
312  
313  
314  
315  
316  
317  
318  
319  
320  
321  
322  
323  
324  
325  
326  
327  
328  
329  
330  
331  
332  
333  
334  
335  
336  
337  
338  
339  
339  
340  
341  
342  
343  
344  
345  
346  
347  
348  
349  
349  
350  
351  
352  
353  
354  
355  
356  
357  
358  
359  
359  
360  
361  
362  
363  
364  
365  
366  
367  
368  
369  
369  
370  
371  
372  
373  
374  
375  
376  
377  
378  
379  
379  
380  
381  
382  
383  
384  
385  
386  
387  
388  
389  
389  
390  
391  
392  
393  
394  
395  
396  
397  
398  
399  
400  
401  
402  
403  
404  
405  
406  
407  
408  
409  
409  
410  
411  
412  
413  
414  
415  
416  
417  
418  
419  
419  
420  
421  
422  
423  
424  
425  
426  
427  
428  
429  
429  
430  
431  
432  
433  
434  
435  
436  
437  
438  
439  
439  
440  
441  
442  
443  
444  
445  
446  
447  
448  
449  
449  
450  
451  
452  
453  
454  
455  
456  
457  
458  
459  
459  
460  
461  
462  
463  
464  
465  
466  
467  
468  
469  
469  
470  
471  
472  
473  
474  
475  
476  
477  
478  
479  
479  
480  
481  
482  
483  
484  
485  
486  
487  
488  
489  
489  
490  
491  
492  
493  
494  
495  
496  
497  
498  
499  
500  
501  
502  
503  
504  
505  
506  
507  
508  
509  
509  
510  
511  
512  
513  
514  
515  
516  
517  
518  
519  
519  
520  
521  
522  
523  
524  
525  
526  
527  
528  
529  
529  
530  
531  
532  
533  
534  
535  
536  
537  
538  
539  
539  
540  
541  
542  
543  
544  
545  
546  
547  
548  
549  
549  
550  
551  
552  
553  
554  
555  
556  
557  
558  
559  
559  
560  
561  
562  
563  
564  
565  
566  
567  
568  
569  
569  
570  
571  
572  
573  
574  
575  
576  
577  
578  
579  
579  
580  
581  
582  
583  
584  
585  
586  
587  
588  
589  
589  
590  
591  
592  
593  
594  
595  
596  
597  
598  
599  
600  
601  
602  
603  
604  
605  
606  
607  
608  
609  
609  
610  
611  
612  
613  
614  
615  
616  
617  
618  
619  
619  
620  
621  
622  
623  
624  
625  
626  
627  
628  
629  
629  
630  
631  
632  
633  
634  
635  
636  
637  
638  
639  
639  
640  
641  
642  
643  
644  
645  
646  
647  
648  
649  
649  
650  
651  
652  
653  
654  
655  
656  
657  
658  
659  
659  
660  
661  
662  
663  
664  
665  
666  
667  
668  
669  
669  
670  
671  
672  
673  
674  
675  
676  
677  
678  
679  
679  
680  
681  
682  
683  
684  
685  
686  
687  
688  
689  
689  
690  
691  
692  
693  
694  
695  
696  
697  
698  
699  
700  
701  
702  
703  
704  
705  
706  
707  
708  
709  
709  
710  
711  
712  
713  
714  
715  
716  
717  
718  
719  
719  
720  
721  
722  
723  
724  
725  
726  
727  
728  
729  
729  
730  
731  
732  
733  
734  
735  
736  
737  
738  
739  
739  
740  
741  
742  
743  
744  
745  
746  
747  
748  
749  
749  
750  
751  
752  
753  
754  
755  
756  
757  
758  
759  
759  
760  
761  
762  
763  
764  
765  
766  
767  
768  
769  
769  
770  
771  
772  
773  
774  
775  
776  
777  
778  
779  
779  
780  
781  
782  
783  
784  
785  
786  
787  
788  
789  
789  
790  
791  
792  
793  
794  
795  
796  
797  
798  
799  
800  
801  
802  
803  
804  
805  
806  
807  
808  
809  
809  
810  
811  
812  
813  
814  
815  
816  
817  
818  
819  
819  
820  
821  
822  
823  
824  
825  
826  
827  
828  
829  
829  
830  
831  
832  
833  
834  
835  
836  
837  
838  
839  
839  
840  
841  
842  
843  
844  
845  
846  
847  
848  
849  
849  
850  
851  
852  
853  
854  
855  
856  
857  
858  
859  
859  
860  
861  
862  
863  
864  
865  
866  
867  
868  
869  
869  
870  
871  
872  
873  
874  
875  
876  
877  
878  
879  
879  
880  
881  
882  
883  
884  
885  
886  
887  
888  
889  
889  
890  
891  
892  
893  
894  
895  
896  
897  
898  
899  
900  
901  
902  
903  
904  
905  
906  
907  
908  
909  
909  
910  
911  
912  
913  
914  
915  
916  
917  
918  
919  
919  
920  
921  
922  
923  
924  
925  
926  
927  
928  
929  
929  
930  
931  
932  
933  
934  
935  
936  
937  
938  
939  
939  
940  
941  
942  
943  
944  
945  
946  
947  
948  
949  
949  
950  
951  
952  
953  
954  
955  
956  
957  
958  
959  
959  
960  
961  
962  
963  
964  
965  
966  
967  
968  
969  
969  
970  
971  
972  
973  
974  
975  
976  
977  
978  
979  
979  
980  
981  
982  
983  
984  
985  
986  
987  
988  
989  
989  
990  
991  
992  
993  
994  
995  
996  
997  
998  
999  
1000  
1001  
1002  
1003  
1004  
1005  
1006  
1007  
1008  
1009  
1009  
1010  
1011  
1012  
1013  
1014  
1015  
1016  
1017  
1018  
1019  
1019  
1020  
1021  
1022  
1023  
1024  
1025  
1026  
1027  
1028  
1029  
1029  
1030  
1031  
1032  
1033  
1034  
1035  
1036  
1037  
1038  
1039  
1039  
1040  
1041  
1042  
1043  
1044  
1045  
1046  
1047  
1048  
1049  
1049  
1050  
1051  
1052  
1053  
1054  
1055  
1056  
1057  
1058  
1059  
1059  
1060  
1061  
1062  
1063  
1064  
1065  
1066  
1067  
1068  
1069  
1069  
1070  
1071  
1072  
1073  
1074  
1075  
1076  
1077  
1078  
1079  
1079  
1080  
1081  
1082  
1083  
1084  
1085  
1086  
1087  
1088  
1089  
1089  
1090  
1091  
1092  
1093  
1094  
1095  
1096  
1097  
1098  
1099  
1100  
1101  
1102  
1103  
1104  
1105  
1106  
1107  
1108  
1109  
1109  
1110  
1111  
1112  
1113  
1114  
1115  
1116  
1117  
1118  
1119  
1119  
1120  
1121  
1122  
1123  
1124  
1125  
1126  
1127  
1128  
1129  
1129  
1130  
1131  
1132  
1133  
1134  
1135  
1136  
1137  
1138  
1139  
1139  
1140  
1141  
1142  
1143  
1144  
1145  
1146  
1147  
1148  
1149  
1149  
1150  
1151  
1152  
1153  
1154  
1155  
1156  
1157  
1158  
1159  
1159  
1160  
1161  
1162  
1163  
1164  
1165  
1166  
1167  
1168  
1169  
1169  
1170  
1171  
1172  
1173  
1174  
1175  
1176  
1177  
1178  
1179  
1179  
1180  
1181  
1182  
1183  
1184  
1185  
1186  
1187  
1188  
1189  
1189  
1190  
1191  
1192  
1193  
1194  
1195  
1196  
1197  
1198  
1199  
1200  
1201  
1202  
1203  
1204  
1205  
1206  
1207  
1208  
1209  
1209  
1210  
1211  
1212  
1213  
1214  
1215  
1216  
1217  
1218  
1219  
1219  
1220  
1221  
1222  
1223  
1224  
1225  
1226  
1227  
1228  
1229  
1229  
1230  
1231  
1232  
1233  
1234  
1235  
1236  
1237  
1238  
1239  
1239  
1240  
1241  
1242  
1243  
1244  
1245  
1246  
1247  
1248  
1249  
1249  
1250  
1251  
1252  
1253  
1254  
1255  
1256  
1257  
1258  
1259  
1259  
1260  
1261  
1262  
1263  
1264  
1265  
1266  
1267  
1268  
1269  
1269  
1270  
1271  
1272  
1273  
1274  
1275  
1276  
1277  
1278  
1279  
1279  
1280  
1281  
1282  
1283  
1284  
1285  
1286  
1287  
1288  
1289  
1289  
1290  
1291  
1292  
1293  
1294  
1295  
1296  
1297  
1298  
1299  
1300  
1301  
1302  
1303  
1304  
1305  
1306  
1307  
1308  
1309  
1309  
1310  
1311  
1312  
1313  
1314  
1315  
1316  
1317  
1318  
1319  
1319  
1320  
1321  
1322  
1323  
1324  
1325  
1326  
1327  
1328  
1329  
1329  
1330  
1331  
1332  
1333  
1334  
1335  
1336  
1337  
1338  
1339  
1339  
1340  
1341  
1342  
1343  
1344  
1345  
1346  
1347  
1348  
1349  
1349  
1350  
1351  
1352  
1353  
1354  
1355  
1356  
1357  
1358  
1359  
1359  
1360  
1361  
1362  
1363  
1364  
1365  
1366  
1367  
1368  
1369  
1369  
1370  
1371  
1372  
1373  
1374  
1375  
1376  
1377  
1378  
1379  
1379  
1380  
1381  
1382  
1383  
1384  
1385  
1386  
1387  
1388  
1389  
1389  
1390  
1391  
1392  
1393  
1394  
1395  
1396  
1397  
1398  
1399  
1400  
1401  
1402  
1403  
1404  
1405  
1406  
1407  
1408  
1409  
1409  
1410  
1411  
1412  
1413  
1414  
1415  
1416  
1417  
1418  
1419  
1419  
1420  
1421  
1422  
1423  
1424  
1425  
1426  
1427  
1428  
1429  
1429  
1430  
1431  
1432  
1433  
1434  
1435  
1436  
1437  
1438  
1439  
1439  
1440  
1441  
1442  
1443  
1444  
1445  
1446  
1447  
1448  
1449  
1449  
1450  
1451  
1452  
1453  
1454  
1455  
1456  
1457  
1458  
1459  
1459  
1460  
1461  
1462  
1463  
1464  
1465  
1466  
1467  
1468  
1469  
1469  
1470  
1471  
1472  
1473  
1474  
1475  
1476  
1477  
1478  
1479  
1479  
1480  
1481  
1482  
1483  
1484  
1485  
1486  
1487  
1488  
1489  
1489  
1490  
1491  
1492  
1493  
1494  
1495  
1496  
1497  
1498  
1499  
1500  
1501  
1502  
1503  
1504  
1505  
1506  
1507  
1508  
1509  
1509  
1510  
1511  
1512  
1513  
1514  
1515  
1516  
1517  
1518  
1519  
1519  
1520  
1521  
1522  
1523  
1524  
1525  
1526  
1527  
1528  
1529  
1529  
1530  
1531  
1532  
1533  
1534  
1535  
1536  
1537  
1538  
1539  
1539  
1540  
1541  
1542  
1543  
1544  
1545  
1546  
1547  
1548  
1549  
1549  
1550  
1551  
1552  
1553  
1554  
1555  
1556  
1557  
1558  
1559  
1559  
1560  
1561  
1562  
1563  
1564  
1565  
1566  
1567  
1568  
1569  
1569  
1570  
1571  
1572  
1573  
1574  
1575  
1576  
1577  
1578  
1579  
1579  
1580  
1581  
1582  
1583  
1584  
1585  
1586  
1587  
1588  
1589  
1589  
1590  
1591  
1592  
1593  
1594  
1595  
1596  
1597  
1598  
1599  
1600  
1601  
1602  
1603  
1604  
1605  
1606  
1607  
1608  
1609  
1609  
1610  
1611  
1612  
1613  
1614  
1615  
1616  
1617  
1618  
1619  
1619  
1620  
1621  
1622  
1623  
1624  
1625  
1626  
1627  
1628  
1629  
1629  
1630  
1631  
1632  
1633  
1634  
1635  
1636  
1637  
1638  
1639  
1639  
1640  
1641  
1642  
1643  
1644  
1645  
1646  
1647  
1648  
1649  
1649  
1650  
1651  
1652  
1653  
1654  
1655  
1656  
1657  
1658  
1659  
1659  
1660  
1661  
1662  
1663  
1664  
1665  
1666  
1667  
1668  
1669  
1669  
1670  
1671  
1672  
1673  
1674  
1675  
1676  
1677  
1678  
1679  
1679  
1680  
1681  
1682  
1683  
1684  
1685  
1686  
1687  
1688  
1689  
1689  
1690  
1691  
1692  
1693  
1694  
1695  
1696  
1697  
1698  
1699  
1700  
1701  
1702  
1703  
1704  
1705  
1706  
1707  
1708  
1709  
1709  
1710  
1711  
1712  
1713  
1714  
1715  
1716  
1717  
1718  
1719  
1719  
1720  
1721  
1722  
1723  
1724  
1725  
1726  
1727  
1728  
1729  
1729  
1730  
1731  
1732  
1733  
1734  
1735  
1736  
1737  
1738  
1739  
1739  
1740  
1741  
1742  
1743  
1744  
1745  
1746  
1747  
1748  
1749  
1749  
1750  
1751  
1752  
1753  
1754  
1755  
1756  
1757  
1758  
1759  
1759  
1760  
1761  
1762  
1763  
1764  
1765  
1766  
1767  
1768  
1769  
1769  
1770  
1771  
1772  
1773  
1774  
1775  
1776  
1777  
1778  
1779  
1779  
1780  
1781  
1782  
1783  
1784  
1785  
1786  
1787  
1788  
1789  
1789  
1790  
1791  
1792  
1793  
1794  
1795  
1796  
1797  
1798  
1799  
1800  
1801  
1802  
1803  
1804  
1805  
1806  
1807  
1808  
1809  
1809  
1810  
1811  
1812  
1813  
1814  
1815  
1816  
1817  
1818  
1819  
1819  
1820  
1821  
1822  
1823  
1824  
1825  
1826  
1827  
1828  
1829  
1829  
1830  
1831  
1832  
1833  
1834  
1835  
1836  
1837  
1838  
1839  
1839  
1840  
1841  
1842  
1843  
1844  
1845  
1846  
1847  
1848  
1849  
1849  
1850  
1851  
1852  
1853  
1854  
1855  
1856  
1857  
1858  
1859  
1859  
1860  
1861  
1862  
1863  
1864  
1865  
1866  
1867  
1868  
1869  
1869  
1870  
1871  
1872  
1873  
1874  
1875  
1876  
1877  
1878  
1879  
1879  
1880  
1881  
1882  
1883  
1884  
1885  
1886  
1887  
1888  
1889  
1889  
1890  
1891  
1892  
1893  
1894  
1895  
1896  
1897  
1898  
1899  
1900  
1901  
1902  
1903  
1904  
1905  
1906  
1907  
1908  
1909  
1909  
1910  
1911  
1912  
1913  
1914  
1915  
1916  
1917  
1918  
1919  
1919  
1920  
1921  
1922  
1923  
1924  
1925  
1926  
1927  
1928  
1929  
1929  
1930  
1931  
1932  
1933  
1934  
1935  
1936  
1937  
1938  
1939  
1939  
1940  
1941  
1942  
1943  
1944  
1945<br



**Figure 1.**

Figure 2.

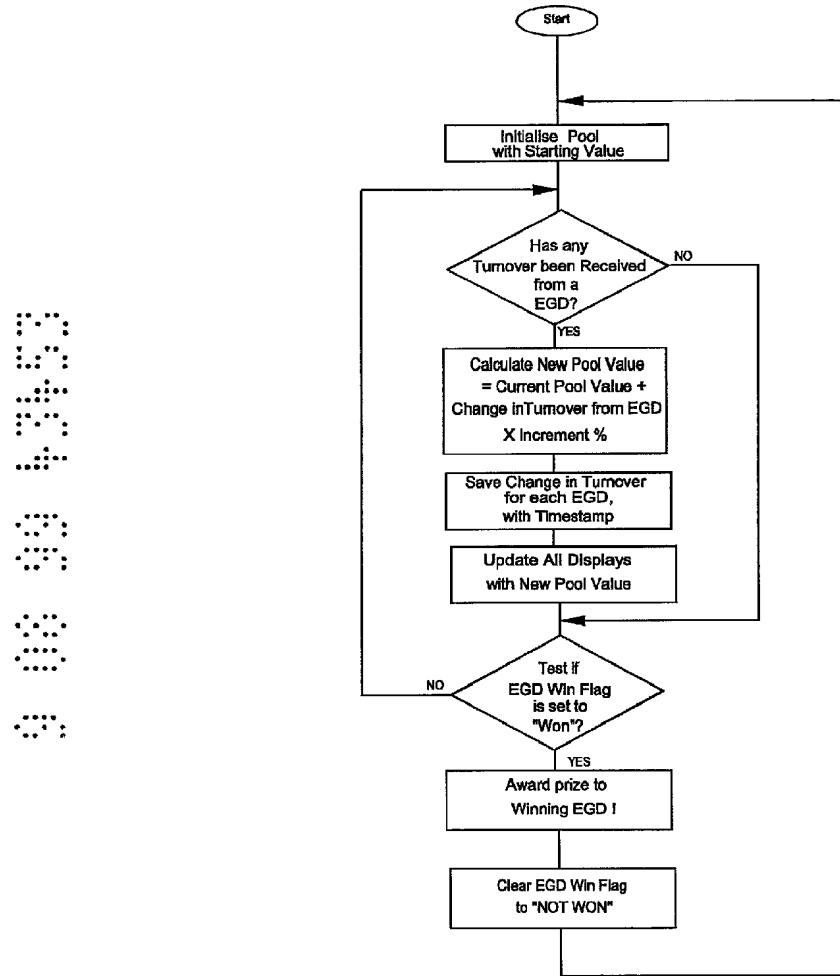


Figure 3.

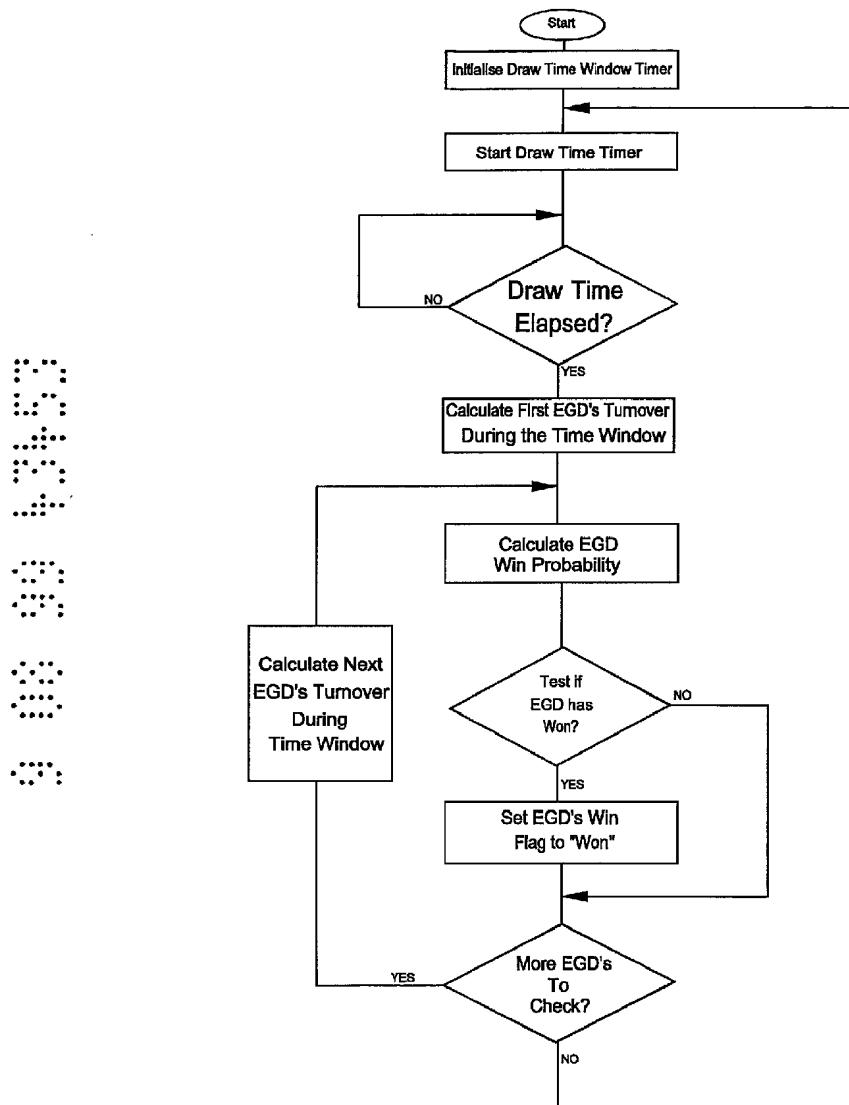


Figure 4.

